ABSTRACT OF THE DISCLOSURE

The present invention describes methods to construct circularization indexers and use them to selectively circularize, purify, and manipulate nucleic acids from a complex nucleic acid mixture. An assay is provided to detect nucleic acid without any amplification. Kits for preparing indexing nucleic acid targets and for high-level multiplexing DNA amplification are provided. The present invention also describes a method to construct a nucleic acids amplification assembly, in which the nucleic acid amplification is self-primed without the need for external primers. In this method, double stranded oligonucleotides with two cohesive ends (C-indexers) are used to circularize double-stranded or single-stranded nucleic acid targets in such a way that one of the strands is completely circularized while the other strand either contains a nick (if the targets are double-stranded) or is only hybridized to part of the targets (if the targets are single-stranded). At the presence of a polymerase, the un-circularized-strand can serve as primer to amplify the circularized strand without any external primer.